GMSEC Adapter Programs

Integrated Test & Operations System
$Date: 2006/03/21 16:07:23 $

ITOS Development & Support Group
NASA/GSFC Code 584, Greenbelt MD 20771

GMSEC Adapter Programs

The GMSEC adapter programs provide publish/subscribe capabilites over the GMSEC messaging bus for ITOS. These adapter programs depend on ITOS to be running but ITOS does not depend on them to perform its tasks. These programs do not need to be started except to publish/subscribe over the GMSEC bus. None of these programs depends on another. So one, none or all of these programs can be running at any given time. To learn more about GMSEC visit the GMSEC portal at `http://gmsec-pbma-kms.intranets.com/`.

In order to use these programs the user must install the GMSEC API as /usr/local/gmsec, add the GMSEC API library path to their library path, and set the ITOS GMSEC global variables. These global variables are:

```
GBL_GMSEC_HOST
GBL_GMSEC_HEADER_VERSION
GBL_GMSEC_MIDDLEWARE_PORT
GBL_GMSEC_REQUEST_PORT
GBL_GMSEC_TLM_PORT
GBL_GMSEC_TLM_FRAME_LENGTH
GBL_GMSEC_MIDDLEWARE
GBL_GMSEC_SSIP
GBL_GMSEC_MISSION
GBL_GMSEC_COMPONENT
GBL_GMSEC_CONSTELLATION_ID
GBL_GMSEC_SAT_ID_PHYSICAL
GBL_GMSEC_SAT_ID_LOGICAL
GBL_GMSEC_SAT_ID_FACILITY
GBL_GMSEC_CLASS
GBL_GMSEC_SUBCOMPONENT1
GBL_GMSEC_SUBCOMPONENT2
```

Setting these globals assists with building the GMSEC message headers and starting the GMSEC programs with the required parameters. There are 3 procedures that come with ITOS that can be used as is or copied and modified to meet user needs. These procedures are: '`gmsec_start.proc`', '`gmsec_sendframes.proc`', and '`gmsec_sendpackets.proc`'.

1 gmarchval

This program will listen for archived mnemonic value requests over the GMSEC bus. The requests will contain telemetry mnemonics and a time range. The program will create a playback directive based on the time range. It will create a sequential print definition file using the requested mnemonics. It will then send a seqprt and playback directive to STOL which will produce a sequential print output file. This output file will be published in a GMSEC archive mnemonic value reply message over the GMSEC bus.

The only argument to this program is the subject name. The program is started as follows:

system (concat("gmarchval GMSEC.", GBL_GMSEC_MISSION, ".", GBL_GMSEC_SAT_ID_PHYSICAL, ".REQ.AMVAL.ITOS "))

where:

GBL_GMSEC_MISSION. Contains the mission name.

GBL_GMSEC_SAT_ID_PHYSICAL. Contains the satellite name.

2 gmdataval

This program will listen for mnemonic value requests over the GMSEC bus. The requests will contain telemetry mnemonics. This program will produce data value messages each time a mnemonic updates.

The only argument to this program is the subject name. The program is started as follows:

system (concat("gmdataval GMSEC.", GBL_GMSEC_MISSION, ".", GBL_GMSEC_SAT_ID_PHYSICAL, ".REQ.AMVAL.ITOS "))

where:

GBL_GMSEC_MISSION. Contains the mission name.

GBL_GMSEC_SAT_ID_PHYSICAL. Contains the satellite name.

3 gmmessage

This program will produce a heartbeat message every 30 seconds by default. There are 2 arguments to this program, subject name and heartbeat rate in seconds. The program is started as follows:

system (concat("gmmessage GMSEC.", GBL_GMSEC_MISSION, ".", GBL_GMSEC_SAT_ID_PHYSICAL, ".MSG.C2CX.ITOS.HB 30"))

where:

GBL_GMSEC_MISSION. Contains the mission name.

GBL_GMSEC_SAT_ID_PHYSICAL. Contains the satellite name.

4 gmpublog

This program publishes log messages over the GMSEC bus. The log messages are gathered from the ITOS event forwarder program. All event messages are published.

The program is started as follows:

system (concat("gmpublog GMSEC.", GBL_GMSEC_MISSION, ".", GBL_GMSEC_SAT_ID_PHYSICAL, ".MSG.LOG.ITOS.OTH."))

where:

GBL_GMSEC_MISSION. Contains the mission name.

GBL_GMSEC_SAT_ID_PHYSICAL. Contains the satellite name.

The subject is used for publishing the log message and the event type is appended to the subject.

5 gmrequest

This program publishes a directive request message. The subject and directive to be published is received from STOL over a known port *GBL_GMSEC_REQUEST_PORT*. The program creates a directive request message from the subject and directive and sends it out over the GMSEC bus.

The program is started as follows:

system (concat("gmrequest GMSEC.", GBL_GMSEC_MISSION, ".", GBL_GMSEC_SAT_ID_PHYSICAL, ".REQ.DIR.ITOS"))

where:

GBL_GMSEC_MISSION. Contains the mission name.

GBL_GMSEC_SAT_ID_PHYSICAL. Contains the satellite name.

Once the gmrequest program is started it will listen over the *GBL_GMSEC_REQUEST_PORT* for subject/directive entries like the following: "GMSEC.WIRE.WIRE1.REQ.DIR.ITOS PAGE STATUS" which would send a "PAGE STATUS" directive to ITOS.

To connect STOL to the port enter the following: open (1234) (concat("localhost:", getenv(ITOS_GMSEC_REQUEST_PORT))) To send a subject/directive pair to gmrequest enter the following: write (1234) "GMSEC.WIRE.WIRE1.REQ.DIR.ITOS PAGE STATUS"

6 gmreqval

This program sends out mnemonic value request messages and is currently only used to test the gmdataval program by making these requests. It will eventually be enhanced to receive the mnemonic value messages from gmdataval and do something useful with them.

The program is started as follows:

system (concat("gmreqval GMSEC.", GBL_GMSEC_MISSION, ".", ;; GBL_GMSEC_SAT_ID_PHYSICAL, ".REQ.MVAL.ITOS 2 /home/mission/mnemfile 0"))

where:

GBL_GMSEC_MISSION. Contains the mission name.

GBL_GMSEC_SAT_ID_PHYSICAL. Contains the satellite name.

The subject is followed by a request type(1=onetime, 2=every value update, 3=stop).

Followed by a file containing the mnemonics, one per line.

Followed by an xml dump flag(0=nodump, 1=dump) which will dump the request message and the reply message from gmdataval.

7 gmsendfrm

This program will publish GMSEC telemetry frame messages over the GMSEC bus. It accomplishes this by connnecting to the frame_sorter to receive telemetry frames and placing those frames into the message DATA field before publishing.

The program is started as follows:

system (concat("gmsendfrm GMSEC.", GBL_GMSEC_MISSION, ".",GBL_GMSEC_SAT_ID_PHYSICAL, ".MSG.TLM.ITOS.RT.CCSDSFRAME.0 RT 0"))

where:

GBL_GMSEC_MISSION. Contains the mission name.

GBL_GMSEC_SAT_ID_PHYSICAL. Contains the satellite name.

The subject is followed by a telemetry type (RT=realtime, RPY=replay, SIM=simulator data).

Followed by virtual channel id (0, 1, 2, etc.)

8 gmsendpkt

This program will publish GMSEC telemetry packet messages over the GMSEC bus. It accomplishes this by connnecting to the frame_sorter to receive telemetry packets and placing those packets into the message DATA field before publishing.

The program is started as follows:

system (concat("gmsendpkt GMSEC.", GBL_GMSEC_MISSION, ".",GBL_GMSEC_SAT_ID_PHYSICAL, ".MSG.TLM.ITOS.RT.CCSDSPKT.0 RT 0"))

where:

GBL_GMSEC_MISSION. Contains the mission name.

GBL_GMSEC_SAT_ID_PHYSICAL. Contains the satellite name.

The subject is followed by a telemetry type (RT=realtime, RPY=replay, SIM=simulator data).

Followed by virtual channel id (0, 1, 2, etc.)

9 gmsubscribe

This program will subscribe to GMSEC directive messages. This program will connect to STOL and send directives extracted from the directive messages to STOL.

The program is started as follows:

system (concat("gmsubscribe GMSEC.", GBL_GMSEC_MISSION, ".",GBL_GMSEC_SAT_ID_PHYSICAL, ".REQ.DIR.ITOS"))

where:

GBL_GMSEC_MISSION. Contains the mission name.

GBL_GMSEC_SAT_ID_PHYSICAL. Contains the satellite name.

10 gmtelem

This program will subscribe to GMSEC telemetry messages. This program will connect to the frame_sorter and send frames or packets extracted from the telemetry messages to the frame_sorter.

The program is started as follows:

system (concat("gmtelem GMSEC.", GBL_GMSEC_MISSION, ".",GBL_GMSEC_SAT_ID_PHYSICAL, ".MSG.TLM.*.RT.CCSDSFRAME"))

or

system (concat("gmtelem GMSEC.", GBL_GMSEC_MISSION, ".",GBL_GMSEC_SAT_ID_PHYSICAL, ".MSG.TLM.*.RT.CCSDSPKT"))

where:

GBL_GMSEC_MISSION. Contains the mission name.

GBL_GMSEC_SAT_ID_PHYSICAL. Contains the satellite name.

The "*" in the subject can be replaced with a specific telemetry publisher if desired.